

Chapter 2

Master Responses

Introduction

This chapter contains master responses concerning subject areas for which multiple comments were received on the Draft SEIR/EIS. Many of the subjects noted below are multifaceted. The master responses are intended to consolidate in one discussion the responses to key issues raised in multiple comments. Responses to issues that fall outside of the master responses are addressed in chapter 3. Underlined text identifies where revisions have been made to the Draft SEIR/EIS. The 18 master responses are listed below.

1. Preferred Alternative
2. Flooding (Novato Creek and Pacheco Pond)
3. Flood Zoning and Marin County Flood Control and Water Conservation District Easements
4. Bel Marin Keys South Lagoon Overflow and Bel Marin Keys Community Service District Drainage Easement
5. Flood Insurance
6. Novato Creek Morphology (Levee Breach and Navigation)
7. Pacheco Pond Outflow Diversion
8. Levee Heights and Locations
9. Aesthetics
10. Dredged Material Quality and Sources
11. Habitat Design
12. Existing Wildlife Habitat
13. Trails and Use
14. Interpretive Center Location
15. Mosquito Breeding Habitat and Pest Displacement
16. Construction Disturbance (Air, Noise, Traffic)

17. Agriculture

18. Climate Change

1. Preferred Alternative

After a review of the Draft SEIR/EIS analysis; the comments received from agencies, the public, and interested organizations; the response to comments presented in this document; and the revised analysis in the Final SEIR/EIS, the project sponsors have selected Revised Alternative 2, as presented below and as described in chapter 3 of the Final SEIR/EIS, as their preferred alternative. This alternative is determined to best meet the Corps' and Conservancy's project goal and objectives while responding to a number of concerns raised by the local community.

Alternative 2, as described in the Draft SEIR/EIS, has been revised as follows.

- a. **Interpretive Center.** The location of the interpretive center/trailhead has been moved from the northwest corner of the expansion site to the City of Novato property west of the seasonal wetland area on the Hamilton Wetland Restoration Project (HWRP) site. This location is the same location included in Alternative 1, and was selected because of its proximity to other planned trails; its separation from the Pacheco Pond wildlife area; and because it is likely to pose less traffic, noise, or other disruptions to adjacent residential areas.
- b. **Bay Trail.** The route of the Bay Trail is the same as in the Draft SEIR/EIS (around the east side of Pacheco Pond) except that the last portion of the Bay Trail would go around the west side of Headquarters Hill. This minor change was added to avoid terminating the trail at a blind curve on Bel Marin Keys Boulevard, to follow the designated trail alignment in the City of Novato and Marin County general plans, and to reduce any associated disruption to the residential areas in Bel Marin Keys.
- c. **No Spur Trail.** The spur trail to Novato Creek has been deleted from Alternative 2 to reduce the potential for adverse public access impacts on restored habitats and to reduce potential disruption to nearby residential areas in Bel Marin Keys.
- d. **Lower South Lagoon Levee.** The improvement to the south lagoon levee would now consist of improving the existing levee itself to an initial construction height of 6 feet national geodetic vertical datum (NGVD), (rather than 10 feet NGVD as proposed in the Draft SEIR/EIS) with a levee crest 50 feet south of the existing levee. This height was selected to allow for settlement to a design height of 5 feet NGVD, which is consistent with the existing levee height, except for several low spots on the levee. The overflow structures would still be included to allow outflow from the south lagoon

when the water level exceeds 1.5 feet NGVD. These structures would be built into the improved levee structure itself. This change was made because it would achieve the heights needed for consistent lagoon containment, and also because the lowered construction height would reduce the visual impact on nearby residential/community views.

- e. **Lower New Levee.** The new outboard levee to be constructed to separate the tidal restoration area from the rest of the site would be constructed to an initial height of 10 feet NGVD, instead of 12 feet NGVD, for a lowering of 2 feet. This change in initial height was implemented to reduce the visual impact on nearby residential/community views. The design elevation of the new levee would remain at 8 feet NGVD as necessary, regarding tidal flooding protection. In order to maintain the 8 feet NGVD design height, it would be necessary to raise the levee to 10 feet NGVD about 6.5 years after initial construction and again just prior to breaching of the outboard levees, which is anticipated to occur approximately 13 years after commencement of construction. This will allow for the initial settling to occur during the construction period and maintenance of the design height.
- f. **New Levee Located further South From South Lagoon.** The new outboard levee adjacent to the tidal marsh restoration area has been relocated to a location at least 1,500 feet from the Bel Marin Keys (BMK) south lagoon levee. The purpose of moving the outboard levee is: a) to reduce the visual impact on nearby residential/community views; b) to expand the capacity of the swale to receive potential overflow from the BMK south lagoon and c) to expand the upland and transitional habitat component. The prior swale was about 230 acres in size and contained 190 acres of upland and 40 acres of seasonal wetland. The revised swale would be about 388 acres in size and would contain about 247 acres of upland and 141 acres of seasonal wetland. This would also change the overall site acreage totals (see table 3-2 in the Final SEIR/EIS).
- g. **Primary Construction Access Route via Hamilton .** The primary construction access route would be from Nave Drive to New Hamilton Parkway, around Landfill 26 and via the Hamilton Army Airfield (HAAF) site instead of Bel Marin Keys Boulevard. The designation of the primary access road would reduce the amount of traffic from construction vehicles on Bel Marin Keys Boulevard. The secondary construction access route would be via Bel Marin Keys Boulevard.
- h. **Improvements to Levees Connected to South Lagoon Lock.** Improvements to approximately 440 feet of existing levee on Conservancy-owned land west of the BMK south lagoon lock have been added and are now included in the preferred alternative. The purpose of improving the existing levee is to prevent bypass flow from Novato Creek in the immediate area west of the lock, which could otherwise increase south lagoon high water levels, and thus increase the amount of potential flow into the BMKV swale. On the east side of the lock, the project design calls for improving the levee

along Novato Creek and the lagoon outlet channel north of the lock to the same height as the new outboard levee (10 feet NGVD), which would also prevent bypass flow around the east side of the lock. By preventing the bypass flow near the lock, a relatively greater amount of the swale capacity would be available for overflow from the south lagoon.

i. **Pacheco Pond Water Management.** While the water management plan would be developed later as part of the detailed design phase, the project sponsors have determined that it would be preferred to maintain the existing outlet from Pacheco Pond to Novato Creek, while adding a new outlet from the pond to the seasonal wetland on BMKV. The seasonal wetland would not require water in the dry season, and thus the existing outlet can be used to drain any baseflow or to modify water levels during the dry season. Further maintaining use of the existing outlet during the wet season would allow drainage during high stage events in the pond via 2 separate outlets, 1 to Novato Creek and 1 to San Pablo Bay (via the seasonal wetland on BMKV), thus enhancing the ability to manage the pond for flood control. Maintenance of some flows through the existing outlet channel would also help to keep the channel open.

j. **Expansion of Pacheco Pond.** In the interest of creating a more diverse array of wetland and wildlife habitats in the preferred alternative, a 21-acre expansion of Pacheco Pond with a 12 acre emergent marsh, was added to Alternative 2. The expanded pond would be similar to, but smaller than the expanded ponds in Alternatives 1 and 2. The pond overflow would be directed via an overflow structure in the surrounding levee leading to a 136-acre seasonal wetland area. This seasonal wetland area is slightly smaller than in the original alternative 2, but as noted above, due to the expansions of the swale, the overall amount of seasonal wetlands has increased to about 277-acres.

All of the remaining features of Alternative 2 as described in the Draft SEIR/EIS have not been revised and are therefore retained as a part of the preferred alternative. The preferred alternative is also considered the environmentally superior alternative. The revised alternative is described in chapter 3 of the Final SEIR/EIS.

2. Flooding (Novato Creek and Pacheco Pond)

A number of comments raised concerns about flooding, the methodology and assumptions used to assess flooding in the hydrologic and hydraulic modeling, the relation of ponding capacity at BMKV to flooding, and the influence of rising sea levels and climate change. This master response concerns flooding effects in regards to the physical effects of the project on Novato Creek and Pacheco Pond. The subsequent master responses discuss flood zoning and drainage easements

and flood insurance. A subsequent master response addresses specifics of overflow from Bel Marin Keys south lagoon.

Potential to Increase Flooding

A number of comments asserted that the project as proposed would result in increased flooding. To reiterate the conclusions of the Draft SEIR/EIS, the proposed project is not expected to result in an increase in peak water surface elevations in Novato Creek or Pacheco Pond. This conclusion is based on the hydrologic and hydraulic modeling studies that are summarized in chapter 4 and described in greater detail in appendix B. The hydrology and hydraulics discussion in appendix B have been updated to more clearly describe the assumptions, methodology, modeling, analysis and conclusions.

Existing Flooding Problems

A number of comments also describe existing flooding problems along Novato Creek and in the Bel Marin Keys community, and inquire about why this project does not resolve the described flooding problems. The project assessed in the Draft SEIR/EIS is an expansion of the existing HWRP project, which was authorized by Congress in 1999. The HWRP project has a defined purpose and authorization, which is environmental restoration. The HWRP project is not a flood control project and is not authorized to address flooding problems. For the BMKV expansion, the same holds true. If the project is determined not to have an adverse effect on flooding, the legal authority under which the BMKV expansion is being considered does not allow the addition of flood control measures to resolve problems that pre-exist and that arose independently of the project. However, the proposed project does, as an incidental benefit, provide additional floodwater routing, particularly as it relates to Pacheco Pond and to off-peak drainage in Novato Creek.

Context of Impact Assessment in the SEIR/EIS

Understanding of the project purpose and authorization is a necessary context to understanding the nature of the assessment of flooding presented in the Draft SEIR/EIS. Unlike a hypothetical flood control project, which might be designed to address a particular set of flooding conditions or might be designed to control flooding levels at a specific height at a certain location, the BMKV expansion is not intended to provide any particular flood control function. However, both NEPA and CEQA require assessment of whether a proposed project would result in an adverse effect on flooding that may affect surrounding properties and development. If a significant adverse effect on flooding were identified, then mitigation (if feasible) to reduce those effects to a less than significant level must

be identified and evaluated. However, if no such significant project-caused adverse effects are identified or if an incidental benefit is identified, NEPA and CEQA do not require a specific quantification of that benefit.

As a result, the hydrology and hydraulic assessment conducted for the Draft SEIR/EIS were designed to first and foremost, assess whether or not the proposed project would or would not increase water surface elevations in surrounding areas, which would consequently increase flooding. The tools and methodology employed in this assessment were selected to answer this question by examining whether or not the proposed project would raise water surface elevations *relative* to without project conditions. They were not employed to generate the results that might be appropriate to support a flood control project or a floodplain management study or a watershed assessment. In short, the analysis is focused on impact assessment of the proposed project's hydrology and hydraulic effects.

Methodology and Assumptions for Analysis

A number of comments questioned the methodology and assumptions used in the modeling including: assertions that the modeling includes insufficiently high flows or durations; relies on "old" or "inaccurate" data; does not take into account the sinuosity (curvature) of Novato Creek; does not take into account the loss of ponding capacity on the expansion site; and does not take into account potential sea level rise and increased storm severity that may result from global warming.

Again, it is important for the document reader to understand that the assessment of hydrology and hydraulics conducted in the Draft SEIR/EIS was a *relative* assessment designed to identify the relative (e.g. positive or negative) effect of the proposed project on peak water surface elevations (e.g. peak flood levels). As a result, the studies were not designed to identify the *absolute* water surface elevations, but instead the relative differences in peak levels with and without the project for scenarios that approximate a 10-year and 100-year storm event.

The studies conducted to support the analysis in the Draft SEIR/EIS are not intended to precisely characterize any and all flooding events in Novato Creek. The UNET 1-dimensional model, which was developed by the Corps, is a standard model used by the Corps, FEMA, and flood control agencies across the state and the country for assessment of flooding in dynamic systems and is an adequate tool for prediction of water surface elevations based on the data used in this study (UNET stands for Unsteady NETwork and is a numerical model that simulates one-dimensional unsteady flow through a full network of open channels). This tool can be used to evaluate whether the existing surface water elevations will rise, fall, or not be changed as a result of the proposed project.

Regarding selection of the parameters used in the model, several comments asserted that higher flows (one mentions 8,000 CFS), longer storm durations (one comment mentions 72-hours), or higher tides (7 feet NGVD is mentioned) are necessary to assess the impact of the project. As described in appendix B, the flow hydrographs were selected based on prior studies conducted for the Corps and 2 scenarios were developed to approximately represent a 10-year and a 100-year storm event. Due to the channel capacity of Novato Creek upstream, existing constrictions (such as at Highway 37 and the nearby railway bridge), and low points in adjacent levees upstream, it is not considered feasible to achieve an 8000 CFS flow in the lower portion of Novato Creek adjacent to the expansion site. The assumed flow inputs approximately represent what is considered to be realistically possible in a 10-year or 100-year event. The 8000 CFS flow is based on speculation that improvements in Novato Creek channel capacity, removal of existing constrictions (such as at Highway 37), and other measures have already been implemented to allow such a potential flow to reach the creek adjacent to the expansion site. While the City of Novato and Marin County have contemplated a number of improvements that may improve creek capacity in certain portions of the Novato Creek watershed, there are no currently proposed projects that would remove the constrictions at Highway 37 and the railroad bridge and no proposals to sufficiently widen Novato Creek to be capable of delivering 8000 CFS to the expansion site. While NEPA and CEQA require the analysis of “reasonably foreseeable” actions, this amount of flow, is at this time, considered speculative and is not an appropriate basis for impact assessment. As to comments that ask for evaluation of a 72-hour storm event duration, as shown in appendix B, the model was run for a period of 100 hours including hydrographs approximately representative of 10-year and 100-year storm events, which is considered adequate for impact assessment. Concerning tide, as described on page 4 of appendix B, the local tide data was adjusted in 2 ways to conservatively estimate tidal conditions using methodology commonly employed by FEMA and the Corps.

Regarding data accuracy and representative nature of the data to Novato Creek conditions, as described in appendix B, existing data from a 1996 bathymetry survey and a 2000 LIDAR (Light Detection and Ranging) topographic survey were used to develop cross-sections for the creek channel. This data is not considered to be either “old” or “inaccurate” as alleged in comment. Also, comments raised the question of whether the curvature of Novato Creek must be taken into account in order to assess impacts. The data used is considered adequate to support the modeling effort. Further, acquisition of new bathymetry or topography is not considered necessary to complete the impact assessment because it is considered highly unlikely to result in different conclusions. On page 5 of the Hydrologic and Hydraulic Modeling memo in appendix B, it notes that “relative differences in peak water surface elevations and flow rates between the alternative conditions assessed in this analysis are fairly insensitive to the small changes in absolute geometric conditions”. This means that the results of the modeling would not substantially change even if more detailed data on the physical conditions of Novato Creek were acquired. Adjustment to take account of sinuosity are not necessary for assessment of channel morphology impacts.

Ponding Capacity and Flooding

A number of comments assert that the proposed project would result in increased flooding due to a loss of existing “ponding capacity” on the expansion site as result of fill (levees and dredged material placement) and tidal inundation. As described in chapter 4 and appendix B, the existing expansion site is surrounded by levees that constrain the hydrologic connections to Pacheco Pond, Novato Creek, and the BMK south lagoon. The levees along Pacheco Pond are at elevations that limit overflow onto the BMKV to storm flow events that result in particularly high pond stages. The levees along Novato Creek range between 5.6 feet NGVD and 8 feet NGVD in elevation, which prevents flow onto the site except when Novato Creek water levels reach these elevations. Flow into the south lagoon is impeded by the presence of the south lagoon lock structure, and thus indirect Novato Creek flow onto the expansion site via the south lagoon, is only possible in the event of bypass flow over the adjacent levees. Thus, although the site contains a large, approximately 1,600-acre area that might receive overflow from adjacent water bodies, these flows only occur during the portion of storm events when a stage reaches the sufficient height to overtop the adjacent levees.

The overflow from Novato Creek onto the existing expansion site was included in the modeling conducted for the Draft SEIR/EIS. The potential overflow from Pacheco Pond to BMKV was added to the model for the Final SEIR/EIS and was found to be negligible; a note to this effect has been added to the technical memo in appendix B. Thus, the actual function of the existing potential ponding capacity has been taken into account in the model scenarios that represented approximate 10-year and 100-year storm events. This baseline of existing conditions was then compared to with-project conditions, and the results were consistent between the initial modeling in the Draft SEIR/EIS and the updated modeling in the Final SEIR/EIS. The results showed that the proposed project would not raise peak water surface elevations in Novato Creek, but would actually lower off-peak water surface elevations compared to existing conditions. The result also show that the proposed project would lower peak water surface elevations in Pacheco Pond compared to existing conditions.

With the project, the nominal ponding capacity of the site, as measured by the hypothetical volume present between 0 and 7 feet NGVD would change from existing conditions due to the addition of levees, the placement of dredged material, and tidal inundation of portions of the site. However, the existing function of that ponding capacity in relation to peak water surface elevations in Novato Creek and Pacheco Pond would either be unchanged (Novato Creek) or actually improved (Pacheco Pond). It should also be noted that the project would not result in a complete loss of hypothetical ponding capacity as the expanded Pacheco Pond area, the seasonal wetland area, the upland/wetland swale area, and even the tidal wetland area, would all be able and are designed to, receive overflow from either Pacheco Pond, Novato Creek or the BMK south lagoon. In regard to Pacheco Pond, the hydrologic connections and overflow areas would

actually improve flooding conditions. In regard to Novato Creek, these hydrologic connections would cause peak stage to remain unchanged, but are expected to reduce off-peak stage, which would be a benefit to drainage of the creek and of the BMK lagoons. The BMK south lagoon is discussed in a separate master response below.

Climate Change and Flooding Impact Assessment

Finally, several comments asserted that the hydrology and hydraulic assessment does not take into account the potential effects of climate change, such as rising sea levels or increased winter storm severity. Rising sea levels would result in higher tides than those at present and could result in increased coastal flooding that could effect the BMK community and other communities located along the Bay or along low-lying areas along tidal creeks, such as Novato Creek. Novato and other coastal communities around San Francisco Bay would also be faced with flooding challenges if future sea level rise is accompanied by more severe winter storms, induced by climate change. While these are serious concerns, the BMKV wetland restoration project is not a flood control project, and its purpose is not to ameliorate present nor future flooding conditions that are not directly caused by the project. The effect of sea rise and potentially more severe winter storms, would be higher tide levels and higher peak flows in Novato Creek and its tributaries. Extrapolation of the results of the hydrologic and hydraulic model are considered adequate to support a conclusion that even in the event of higher tides and higher flows than those used in the modeling, the mechanisms of flow routing used in the model would still be valid and the proposed project would not worsen flooding relative to conditions without the project. Master Response 18 provides further discussion rising sea levels and project design.

3. Flood Zoning and Marin County Flood Control and Water Conservation District Easements

A number of comments assert that the project does not comply with the F2 overlay zoning or with the existing drainage easements in place with the Marin County Flood Control and Water Conservation District (MCFWCWD). In addition a number of comments assert that the 300-acre easement on the expansion site is held for the exclusive use of Bel Marin Keys Unit IV. Other comments assert that the project would have a significant effect on flooding unless the drainage easements are maintained or replaced in kind.

Analysis of Consistency with F2 Zoning in the Draft SEIR/EIS

The existing flood zoning of the expansion site, the requirements of the zoning ordinance, the existing easements and their requirements are presented in the hydrology and tidal hydraulics section in chapter 4 and in appendix C. The Draft SEIR/EIS concludes that the project may not be consistent with the specific prohibitions on fill in the F2 zone and the requirements for provision of an ultimate channel or its equivalent in the event that greater than 25% of the existing ponding capacity of the site is lost. The Draft SEIR/EIS also concludes that the project would not maintain the existing MCFCWCD easements in situ and the replacement ponding areas may or may not be determined to be appropriate replacements.

As noted in Master Response 2 above, the hydrologic and hydraulic studies conducted for the project to date have not identified an adverse effect on flooding due to the proposed project or an increase in the water surface elevations of adjacent water bodies. These studies include an evaluation of the existing hydrologic connections of the expansion site and the function of the site in terms of affecting water surface elevations of adjacent water bodies. The Draft SEIR/EIS concludes that no physical adverse effect on flooding would result from the proposed project and there would be flood benefits in term of reduction of peak flood stage in Pacheco Pond.

F2 Zoning, Easements, and Ponding Capacity

Both the F2 zoning and the MCFCWCD easements are based on the proposition that ponding capacity in flood overflow areas adjacent to floodways should be preserved in order to provide reduction in flood levels in those adjacent floodways. The F2 zoning requirements further require that should more than 25% of the ponding capacity be removed from a site within the zone, that flood control improvements should be built through the subject property that are equivalent to the designated “ultimate channel” or its equivalent. As noted above, the project would not eliminate all ponding capacity on the site, and would establish hydrologic connections to the remaining ponding capacity that are as effective or more effective than those that exist at present, in particular related to the projected lowering of Pacheco Pond peak water stage, something that would not occur without the project. Though fill (in the form of levees) and tidal inundation would lower the nominal ponding capacity on the site, the change in hydrologic connections makes the remaining ponding capacity effective by providing hydrologic connections that route flow onto the expansion site at far lower stage than possible at present.

The preferred alternative, Revised Alternative 2, includes designs for hydrologic connections from Pacheco Pond and the BMK south lagoon to retained areas on

the BMKV parcel. Based on a preliminary estimate, the 387-acre swale area would have a ponding capacity of about 450 acre-feet at the overflow structure invert elevation of 1.5 feet NGVD and a ponding capacity of over 1,000 acre-feet when the water surface elevation in the swale reaches 3.5 feet NGVD (assuming overflow structures are 24-inch culverts). The maximum capacity would depend on the final design for the swale and the overflow structures, as it is possible for the swale to fill to the adjacent levee design height of 5 feet NGVD. The expanded Pacheco Pond/emergent marsh area would have a capacity of 175 acre-feet (between 1.5 feet NGVD and 7 feet NGVD). The 136-acre seasonal wetland area connected to the expanded Pacheco Pond would have a ponding capacity of about 400 acre-feet below the 1.5 feet NGVD invert elevation of the overflow structure and a capacity of about 650 acre-feet when the water surface elevation in the seasonal wetland reached 3.5 feet NGVD (assuming the overflow structures are 24" culverts). The maximum ponding capacity of the seasonal wetland will depend on the final design for the seasonal wetland and the overflow structure. These ponding capacities have been added to the Draft SEIR/EIS hydrology section and a table showing the calculations has been included in appendix B. The ponding capacity of the tidal marsh wetland adjacent to Novato Creek varies with the tide. However, with the lowering of the outboard levee, the tidal marsh restoration area can also receive overflow from Novato Creek when stage is above MHW (about 2.8 feet NGVD). The Conservancy is willing to work with the MCFCWCD to record amended drainage easements for the new ponding areas if the MCFCWCD determines this is necessary to comply with the easements or the F2 zoning.

It should also be noted that the concept that a reduction in ponding capacity directly relates to an increase in flood levels is subject to question in a tidally-dominated system like the lower portion of Novato Creek. The expansion site is directly adjacent to San Pablo Bay and tidal stage, as described in the Draft SEIR/EIS is a driving force in determining flood stage. As a result, in the current setting, much of the potential overflow that reaches BMKV over the existing levees is actually tidal flow that comes from a virtually inexhaustible supply - San Francisco Bay and the Pacific Ocean. Routing of primarily tidal flow from Novato Creek at high stage levels onto BMKV has little potential to lower flood levels in the creek due to the replacement in the creek by tide from the Bay. The Draft SEIR/EIS makes no conclusion regarding whether the ponding capacity concept may work in a more linear fashion in other portions of the Novato Creek watershed further upstream that are less influenced by tidal flow. However, the Draft SEIR/EIS does conclude that the proposed project, even if it is determined to reduce the nominal ponding capacity represented by the F2 zoning or the easements, would not result in increased flooding and would actually provide flood benefits.

Agreement between Conservancy, MCFCWCD and City of Novato

In recognition of the concerns of the City and County and local residents concerning the F2 zoning and the MCFCWCD easements relative to the site, the Conservancy, the MCFCWCD, and the City of Novato have developed an Agreement that establishes a process by which further hydrologic and hydraulic studies will be developed, completed, and reviewed to examine the potential effects of the proposed project on water surface elevations in Novato Creek and other parts of the lower portion of the Novato Creek watershed. Although the lead agencies believe that further studies are beyond that necessary for impact assessment under NEPA and CEQA, the Conservancy as the local sponsor of the project has agreed to conduct these additional studies that the City and County believe are necessary to make determinations concerning the consistency of the project with the F2 zoning and with the MCFCWCD easements. The lead agencies expect that these additional studies will confirm the results of the study to date and the conclusion in the Draft SEIR/EIS that the proposed project would not increase flooding, and thus do not believe these studies are necessary for the completion of the NEPA and CEQA processes. The Agreement contains performance standards for the project design. These performance standards are simply that the proposed project must be shown to not increase peak water elevations in Novato Creek, Arroyo San Jose, Pacheco Creek, Pacheco Pond, Bel Marin Keys lagoons, or any other part of the Novato Creek watershed. If the studies do not show this (something the project sponsors believe is highly unlikely), the Conservancy has agreed not to proceed with construction of the project until flooding issues are resolved to the satisfaction of the City and County. The Agreement is included in appendix I.

Determination of Significance under NEPA and CEQA

The focus of NEPA and CEQA are on physical effects of proposed projects that may result in significant adverse effects on the environment. It is the lead agencies' determination that even if there were an inconsistency with the F2 and the MCFCWCD easements, this would not represent a significant effect under NEPA or CEQA because the studies conducted for the SEIR/EIS demonstrate that the project would not result in increased peak water surface elevations or flooding, as compared to the no-project alternative. The local sponsor has further established a process with the City of Novato and the MCFCWCD to develop the information needed to resolve the consistency of the project with the F2 zoning and MCFCWCD easements.

4. Bel Marin Keys South Lagoon Overflow and Bel Marin Keys Community Service District Drainage Easement

A number of comments assert that the alternatives presented in the Draft SEIR/EIS do not contain sufficient area within the swale adjacent to the BMK south lagoon to contain overflow from the lagoon in compliance with the existing BMK CSD overflow easement. These comments recommend that the swale be enlarged by moving the containing levee further away from the south lagoon.

Enlarged Swale in Preferred Alternative

First, in the preferred alternative, Revised Alternative 2, the levees have been moved back significantly from the south lagoon, which has increased the acreage of the swale from about 190 acres (in the Draft SEIR/EIS Alternative 2) to about 387 acres, which represents a doubling in size. Further, the preferred alternative now contains certain improvements to the levees adjacent to the south lagoon lock and to a portion of lock structure itself to reduce the likelihood of bypass flow from Novato Creek skirting the lock in the immediate vicinity of the lock itself. These improvements reduce the likelihood of Novato Creek surcharging the south lagoon.

A preliminary estimate of the amount of possible flow due to direct precipitation in the southern portion of the BMK community (e.g south of Bel Marin Keys Boulevard) including homes, streets and the lagoon was made. The area of the BMK south lagoon and the homes and streets that drain to the lagoon is approximately 242 acres. The estimated area of the swale is about 387 acres. Based on the NOAA *Precipitation-Frequency Atlas of the Western United States* (NOAA 1973), the 100-year 24-hour precipitation for the project area is 6 inches. For the swale area, south lagoon, and homes and streets that drain to the south lagoon this corresponds to about 315 acre-feet. The new overflow structures would be set at 1.5 feet NGVD to allow overflow into the BMKV swale when the lagoon exceeds this elevation as required by the existing BMK CSD easement. Below 1.5 feet NGVD, the swale would have a capacity of about 450 acre-feet, which could contain the flow noted above over several tidal cycles, until the swale can fully drain. As noted above, the capacity of the swale would be higher than just the capacity below 1.5 feet NGVD. By increasing the swale capacity and reducing the likelihood of Novato Creek flow directly into the south lagoon, the project has provided for an alternate mechanism of complying with the BMK CSD easement and has actually reduced the potential flood flow into the lagoon itself with the lock improvements.

MCFCWCD Easements

A number of comments asserted that the 300-acre MCFCWCD easement on the eastern side of the expansion site is an easement held by the BMK community or the BMK CSD. This is not accurate, as the only parties to the 300-acre easement are the MCFCWCD and the Conservancy (as owner of the property). Also, the 300-acre MCFCWCD easement is not related to the BMK CSD easement that allows overflow from the south lagoon onto the BMKV property. Rather, the 300-acre easement was established as mitigation for the initial filling of approximately 100 acres to build the BMK IV development and the MCFCWCD holds the rights to that easement, not the BMK CSD. Consistency with this easement is discussed in the prior master response.

5. Flood Insurance

A number of comments express concern that the proposed project would result in changes to the mapping of special flood hazard zones by FEMA, thus resulting in a change in flood insurance rates of residents that may be located in a remapped zone. The discussion below has been added to the Final EIR/EIS.

The preferred alternative would change flood mapping zones on the expansion site itself, but would not change flood mapping of adjacent areas because the hydrologic and hydraulic studies conducted as part of the conceptual design have identified that the project would not result in an increase in flood stage in adjacent waterbodies or increased risk of flooding to adjacent properties. Because a portion of the site would be opened up to tidal action, the portion of the expansion site eastward of the new outboard levee would be remapped from an A (riverine flooding) zone to a V (coastal flooding) zone. However, the new outboard levee would be designed to prevent tidal flooding from reaching the remainder of the expansion site, thus the remainder of the site is likely to remain unchanged from its current Flood Insurance Rate Map (FIRM) designation.

National Flood Insurance Program Overview

The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP). There are 3 components within the NFIP: (1) flood hazard mapping, (2) floodplain management, and (3) flood insurance. Engineering studies, referred to as flood insurance studies (FISs) are conducted to characterize flooding risks within a community by identification of base flood elevations (BFE). The BFEs are the elevations of the 100-year storm event (referred to as the base flood) identified in the FIS. The results of the FIS are used to identify special flood hazard areas (SFHA), which are areas that the FIS indicated would be inundated by the 100-year storm event. These areas are then identified in the FIRMs).

Communities participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Marin County (within which the BMKV and the BMK community are located) is a participant in the NFIP with the MCFCWCD as the local community agency responsible for floodplain management. To get secured financing to buy, build, or improve structures in a SFHA, homeowners are required to purchase flood insurance. Flood insurance is not mandatory if located outside the SFHA. Flood insurance rates are determined based on the risk zone identified on the FIRMs.

Local Flood Insurance Studies and Flood Mapping

FEMA conducted a FIS for the unincorporated parts of Marin County, including the BMKV site and the BMK residential area in 1972, published a flood hazard boundary map in 1977 and published a FIRM in 1982 (Federal Emergency Management Agency 1982 and 1986). FEMA completed an additional FIS for the unincorporated parts of Marin County in 1986, but did not update the FIRM for the BMKV site (Federal Emergency Management Agency 1986a). FEMA also completed an FIS for the City of Novato (including areas adjacent to the BMKV site and the BMK residential area) and published associated FIRMs in 1989 (Federal Emergency Management Agency 1989a and 1989b). The FIRMs for the relevant parts of unincorporated Marin County (Panels 0601730259 and 0601730300) identify the BMKV site as within the A1 zone (BFE of 6 feet NGVD) (Federal Emergency Management Agency 1982 and 1989b). The BMK residential area is identified as located within the C zone [which is not a flood hazard zone], with the exception of a low-lying area along Novato Creek and the BMK lagoons, which are located within the A1 zone (BFE of 6 feet NGVD) (Federal Emergency Management Agency 1982). The FIRM for the City of Novato (parcel 0601780005) shows Pacheco Pond as within the AE zone (BFE of 8 feet NGVD) (Federal Emergency Management Agency 1989b). The BMKV site, the BMK lagoons, and Pacheco Pond are mapped as within SFHAs; the BMK residential area and Headquarters Hill are not. Flood insurance is available for BMK residences within the C zone, but it is not required by regulation in this zone. Copies of relevant portions of the local FIRMs are included in appendix C.

Potential for Changes in Flood Mapping

FEMA periodically updates the FIRM maps based on new FISs. New studies utilize the latest data reflecting the physical conditions within a studied community relevant to flooding. Sometimes these new studies will result in changes in mapping of SFHAs. Based on the hydrologic and hydraulic studies to date, the proposed BMKV expansion would not result in changes that would be

the basis for SFHA mapping changes, except those relevant to the tidal marsh restoration area on the expansion site itself.

F2 Zoning and Floodplain Mapping and Management

Several comments also question the relation of the F2 zoning of the expansion site and mapping of flood risk zones. The FIS studies are engineering studies that focus on the physical nature of communities relevant to flooding. The 1982 FEMA FIS for the project area makes no mention of the F2 zoning. In conversation with several MCFCWCD staff concerning the BMKV project, none have identified any direct relation between the F2 zoning and FEMA FIRM mapping or any mention of F2 zoning in FEMA flood studies. As noted above, a local community must adopt floodplain management regulations in order to participate in the NFIP. The F2 zoning is part of MCFCWCD floodplain management regulations. As discussed in the Draft SEIR/EIS, the F2 zoning ordinance prohibits fill in the F2 zone if it will reduce the ponding capacity of a site by more than 25%. The hydrology and hydraulic studies (see Master Response 2) have demonstrated that, although fill would be placed on the site, the preferred alternative would not result in a loss of ponding capacity that would result in an increase in flood levels.

Changes Related to the Project and FEMA Floodplain Management Criteria

Local floodplain management regulations are required to meet the minimum standards found in FEMA regulations, which are located in 44 CFR Section 60. As identified in 44 CFR Section 60.12, for state-owned properties in special hazard areas, the state is required to either (a) comply with the flood plain management requirements of a local community within which the state-owned properties are located or (2) establish and enforce flood plain management regulations which satisfy the minimum criteria found in FEMA regulations (44 CFR 60.3, 60.4, and 60.5).

Flood plain management criteria for flood-prone areas are presented in Section 60.3. In Section 60.3(d)(3), the FEMA regulations identify that construction (including fill) should be prohibited in the regulatory floodway unless it is demonstrated through hydrologic/hydraulic studies that the proposed encroachment would not increase flood levels. It is the project sponsors' conclusion that the proposed project is consistent with FEMA floodplain management criteria. The Conservancy, as the state lead agency and owner of the expansion site, has committed in the Agreement that, in the unlikely event that the confirmatory studies to be done under the Agreement indicate that the project would increase peak flood levels above baseline in Novato Creek, Pacheco Pond,

the BMK lagoons, or any other part of the Novato Creek watershed, it would not proceed with construction of the project until flooding issues are resolved.

6. Novato Creek Morphology (Levee Breach and Navigation)

Regarding potential morphological changes in Novato Creek due to the proposed breach on Novato Creek, several comments assert that the Draft SEIR/EIS does not assess or describe project effects adequately in the Novato Creek channel and the subtidal channel to the Petaluma channel; does not assess short-term sedimentation post-breach or long-term sedimentation up and downstream of the breach; does not use current or accurate data to describe the existing channel geometry; does not provide sufficient modeling of tidal hydraulic effects; does not provide calculations for increased tidal prism for each alternative; and does not assess the effect on BMK lagoon drainage due to the increase in tidal flow in lower Novato Creek. Comments also suggest that the proposed project would have a negative effect on channel width and depth, and thus the project should dredge Novato Creek as mitigation. Some comments also suggested monitoring of the channel after breach excavation. Each of these items is addressed below. Effects on channel morphology related to Pacheco Pond outlet flow diversion are discussed in the next master response.

Project Purpose

First, it should be noted that navigation is not a purpose of the HWRP and the BMKV expansion, and as such the project is not designed to improve navigability of Novato Creek. However, under NEPA and CEQA, an assessment of the potential negative effects on creek morphology and on navigation are required to determine their significance and whether mitigation is required. The tidal hydraulics analysis is summarized in chapter 4 and discussed in appendix B in the Draft SEIR/EIS and concludes that project would not adversely affect Novato Creek morphology or adversely effect navigability. The Draft SEIR/EIS identifies that the project would actually benefit navigability by increasing the equilibrium width and depth of the creek channel below the levee breach.

Impact Assessment Methodology

The methodology used to assess channel morphology below the proposed breach is presented in the second memo in appendix B. The 1-dimensional hydraulic model, UNET, was used to determine channel velocities in Novato Creek due to an increase in tidal exchange and a statistical analysis of the relation of tidal prism to channel width based on data collected across the Bay Area, including

Novato Creek. Cross sections were developed to estimate existing and likely future geometries of Novato Creek. The hydraulic model was then used based on the determined parameters to estimate sheer stresses and incremental erosion that would result due to increased tidal exchange. The statistical analysis established a relationship between the size of channels and the upstream tidal prism volume. The geomorphic and hydraulic modeling showed that the increase in tidal prism attached directly to Novato Creek (about 600 acres in the preferred alternative; 350 acres in Alternative 1; and none in Alternative 3 due to no design breach) is estimated to result in an expected equilibrium channel width after the breach to Novato Creek is excavated that is about 10-40 feet wider and about 0.5-1.0 feet deeper than at present. (Note: Depth has been added in appendix B morphology memo.)

Dredging events may increase the width and depth of the creek beyond the current or future equilibrium. The channel would move back toward this equilibrium between dredging events. The changes in channel morphology between dredging events that are unrelated to the proposed project were not specifically studied, as they are not related to project-caused effects.

Calculations of the increase in tidal velocity below the breach in Alternative 1 and 2 have been made and added to the Final SEIR/EIS, appendix B.

Characterization of Potential Impacts

The effects on the subtidal channel beyond the mouth of Novato Creek to the Petaluma channel (from Marker 25 to Marker 1) are discussed in the Draft SEIR/EIS (see Impact TH-8), but the prospective increase in channel width and depth is not quantified. The increase in tidal prism will increase the erosion of existing tidal flat immediately adjacent to the subtidal channel resulting in a loss of about 10 to 15 acres of tidal flat. Whether this will result in a noticeable increase in channel width or depth of benefit to navigation is not determined in the Draft SEIR/EIS; however the erosion of tidal mudflat would not result in a decrease in channel width or depth, either of which would be a negative effect on navigation. A new figure, figure 4-7, has been added to the document to identify the location of expected morphological changes to lower Novato Creek and the low-water channel to the Petaluma channel.

BMK Lagoon Flushing and the Krone Report

One commenter suggest that the levee breach may create channel conditions or tidal flows that would conflict with, impede, or reduce the effectiveness of the existing lagoon flushing conducted by the BMK CSD to promote scouring in the navigational channel. A report by Ray Krone was submitted to support this assertion. The Krone report identifies optimum lagoon flushing procedures to provide scouring current along the Novato Creek channel to favor navigation of

the channel. Much of the procedures are designed to create flows with optimum erosional force to promote channel scouring. The effect of these procedures is to add periodic surcharge of the flow in the creek. These flushing events are presently conducted approximately once or twice every month.

The proposed project would add increased tidal flow into Novato Creek, which would increase scour in Novato Creek through the same erosional procedures that the BMK CSD uses themselves when it flushes the lagoons. The difference is that the project-induced increased flow would occur daily compared to BMK CSD lagoon flushing events that occur once or twice a month.

The referenced Krone report noted “the importance of maintaining channel depths at the mouth to station 0+00 particularly to assure a low tide at the mouth”. The proposed levee breach, as noted in the Draft SEIR/EIS would increase equilibrium channel depth, albeit in a limited way. This would assist in maintaining depth as recommended in the Krone report. Overall, the increase in tidal prism and flows below the breach is consistent with the recommendations in the Krone report because it increases currents along the lower portion of the Novato Creek channel and in the subtidal channel beyond resulting in enhanced scour that helps to maintain both width and depth in a channel used for navigation.

Short-Term Sedimentation

Regarding short-term sedimentation immediately after the breach of the Novato Creek levee, there is the potential for limited amounts of unconsolidated material to be mobilized from the expansion site during ebb tides. This potential increase in transport of colloidal particles would weakly increase the suspended sediment effluent concentration from the site on ebb tides immediately following the breach of the Novato Creek levee. The plume of slightly elevated suspended sediment would quickly dissipate through flow into and dispersion in the Bay. Suspended sediment concentrations entering the creek on flood tides would be at or near ambient Bay suspended sediment concentrations. Increased tidal flow would produce a net increase in tidal scour that would more than offset the temporary increase of suspension of sediments. Ebb tide suspended sediment concentrations from the expansion site would decrease below ambient Bay suspended sediment concentrations following the breach as the site materials consolidate and the site reverts to a net sediment sink. Discussion of short-term sedimentation effects has been added to the *Surface-Water Hydrology and Tidal Hydraulics* section in chapter 4.

Long-Term Sedimentation

Regarding long-term sedimentation, the tidal basin itself attached to the Novato Creek breach is designed as a sediment trap in order to capture natural sediment

to form the final cover for the restored wetland area. Thus during formation of final marsh elevations after breach (a process that would take approximately 10 years), the site would actually capture a portion of the sediment from Novato Creek and San Pablo Bay flows. The functioning of the site as a sediment trap until marsh plain equilibrium is reached and the increase in tidal flows below the breach results in a net erosional effect in the creek channel, as noted above, and no long-term increase in sedimentation (that might negatively effect navigation) has been identified in the studies conducted for the Draft SEIR/EIS.

Novato Creek Channel Monitoring

The monitoring and adaptive management plan for the HWRP has been updated to include the BMKV expansion and includes monitoring of the Novato Creek channel upstream and downstream of the levee breach. This updated plan is included as an appendix to the Final SEIR/EIS.

7. Pacheco Pond Outflow Diversion

Comments identified concerns that the potential diversion of some or all of the existing Pacheco Pond outlet flow into Novato Creek may change the channel width and depth resulting in adverse effects on navigation, flooding, creek habitat, water quality. Also, some comments assert that the potential closing of the existing outlet or diversion of outlet flow would eliminate tidal prism in Pacheco Pond or would avert the potential for future restoration of “historic” flow conditions from Arroyo San Jose to Novato Creek. Some comments assert that the Draft SEIR/EIS did not analyze the effects of potential outlet flow diversion during low-flow as well as high-flow events. Finally, some comments assert that the potential diversion would have a significant effect on anadromous species access to the pond and its tributaries.

Water Management Changes in Preferred Alternative

The project includes development of a new water management plan for Pacheco Pond by the MCFCWCD, the DFG, and the project sponsors. The preferred alternative has been changed to reflect that the existing outlet would not be permanently closed, so as to increase the options for water management. The preferred alternative proposes routing flow from Pacheco Pond to the seasonal wetland on BMKV for 2 purposes: 1) to provide seasonal flow to support the seasonal wetland area and create a freshwater to saltwater interface in the tidal marsh area; and 2) to provide expanded ponding capacity for Pacheco Pond to lower peak stage levels and reduce flooding risk to adjacent properties. Since the water is to be used for a seasonal wetland as opposed to a perennial wetland, there is no need to route water during the dry months from the pond for habitat

purposes; thus the existing outlet can be used to drain any dry month base flow. Further, maintaining the existing outlet provides 2 outlets to help drain the pond during storm events—1 to Novato Creek and 1 to the seasonal wetland and San Pablo Bay—which would assist in reducing high stage in the pond. Maintenance of some flow through the existing outlet would also help to keep open the existing outlet channel. The new management plan would seek to optimize the flood control and wildlife conservation purposes of Pacheco Pond while providing seasonal flow to the BMKV seasonal wetland area.

Effects of Diversion on Novato Creek

The concern most commonly identified regarding diversion of some or all of the existing Pacheco Pond outlet flow is that it would decrease channel width or depth in Novato Creek due to either reduction in scour or increase in sedimentation.

The dominant determinant of scour in this portion of Novato Creek is the daily ebb and flow of the tide. While episodic changes in creek morphology may occur due to extreme flow events in Novato Creek, even these changes are negligible compared to the persistent erosional force of daily tidal flows.

Pacheco Pond peak flows during storm events into Novato Creek are limited by the existing MCFCWCD flapgates to about 780 cubic feet per second (CFS). This amount can be compared to the main stem flows in Novato Creek just upstream of the existing outlet which were estimated in the hydrologic and hydraulic modelling done for the project at about 1740 CFS in Scenario A (approximate 10-year event) and 3740 CFS (approximately 100-year event). In the modeled events, due to dynamic effects, the proposed project is estimated to lower Novato Creek flow just downstream of the existing outlet (due to assumed diversion of outlet flow) by about 420 CFS in Scenario A and 380 CFS in Scenario B (see new memo in appendix B), compared to existing conditions. Non-storm-event flows were not modeled; however, as discussed above, dominant determinant of scour in lower Novato Creek is tidal flow, not fluvial flow.

Given the limited flows of Pacheco Pond compared to the main stem of Novato Creek and the tidal domination of this portion of the creek, diversion of the outflow to the expansion site is identified in the SEIR/EIS as resulting in negligible changes in morphology to lower Novato Creek that would not effect navigation. Because only negligible changes in creek channel width and depth have been identified in association with diversion of Pacheco Pond outlet flows, no associated adverse effects on navigation, flooding, or habitat quality in Novato Creek are expected due to the diversion of some or all of the outlet flow during the rainy season.

Concerning water quality, the Draft SEIR/EIS identifies that the primary concern of diverting Pacheco Pond outlet flow would be potentially reducing salinity levels in Novato Creek. However, as identified in the *Water Quality* section of chapter 4, during low-flow summer conditions, the flow from Pacheco Pond is minimal compared to the daily tidal prism, which controls salinity levels. During high-flow events, Pacheco Pond outflow is estimated to provide only a few hours, at most, of freshwater flows to the creek, which has a negligible effect on salinity levels because main stem flow in Novato Creek already cause a change in salinity levels and after the storm event, salinity levels return to a level determined by tidal flows.

Historic Course of Arroyo San Jose

Concerning the potential for the project to avert any potential to restore a natural course of Arroyo San Jose to a confluence with Novato Creek north of the present location of Pacheco Pond and any potential to restore tidal action to Pacheco Pond itself, the following discussion is provided. The project designers reviewed available historic maps and surveys for the project area going back to mid 1850s. An 1863 U.S. Coast and Geodetic Survey based on an 1854 survey shows a fairly wide tidal marsh plain adjacent to San Pablo Bay and Novato Creek but does not extend far enough westward to show Arroyo San Jose (U.S. Coast and Geodetic Survey 1863). An 1860 map of Marin County shows Arroyo San Jose entering “salt marsh” in the approximate location of Pacheco Pond today, joining a tidal channel that flows northward and then northeast to enter Novato Creek (Van Dorn 1860). At some point prior to 1914, the existing outlet channel (now just north of BMK Boulevard) was constructed, presumably as part of agricultural reclamation of nearby land (U.S. Geological Survey 1914). As of 1914, a natural channel was still present in a similar location as 1860, and was shown entering Novato Creek in a location north of present-day railroad bridge at Highway 37 (U.S. Geological Survey 1914). At some point, prior to 1942, it appears that the natural channel was eliminated, and all of the flow from Arroyo San Jose was rerouted to enter Novato Creek through the existing outlet just north of Headquarters Hill (U.S. Geological Survey 1942). Reference in the Draft SEIR/EIS to the historic route of Arroyo San Jose has been updated with this information. Copies of relevant portions of the referenced historical maps are included in appendix B.

Potential for Return of Tidal Prism to Pacheco Pond

The project has not been designed to precisely mimic prior site conditions at a specified time in history; though in general the project has been designed to restore at least a portion of the wide tidal marsh plain that was present prior to the 1850s. The existing MCFCWCD tidal flapgates are designed to prevent tidal intrusion into the pond. These structures have been recently repaired. Prior to their repair, tidal intrusion did occur over a period of time. Based on the present

baseline, diversion of Pacheco Pond outflow would not eliminate any tidal prism in the pond, because the tidal flapgates already do this.

DFG and MCFCWCD manage Pacheco Pond for the dual purposes of flood control and wildlife conservation. The introduction of tidal flows into Pacheco Pond, as one commenter apparently supports, would dramatically change the habitat in the brackish pond and would significantly lower its flood control function. The current habitat present in Pacheco Pond and in the immediate upstream portions of the tributaries are dominated by brackish open water and marsh species, although the saline soils, the proximity to tidal areas (Novato Creek) and the prior intrusion of tide into the pond has resulted in the presence of tidal marsh species (such as pickleweed) as well. The agreement between DFG and MCFCWCD calls for maintenance of the water surface elevation of 1.5 feet NGVD to favor these brackish environments. Introduction of tide into this area would change these habitats dramatically.

The prevention of tide is also crucial to function of the pond for flood control. In times of high flow, the pond can receive and hold flows from its 2 tributaries and then release that flow at low tide when Novato Creek stage is sufficiently low. If the tide were allowed into the pond, its storage volume would be the same as at present at low tide, but would be cut by more than 50% at high tide and more in the event of a plus tide. This would create a backwater effect in the tributaries and under certain conditions might result in localized flooding in the business park and in the nearby trailer park. This would be considered a significant adverse flooding impact.

While restoration of Pacheco Pond to tidal action would result in conditions more consistent with “historic” conditions, the loss of freshwater habitat and flood control functions would constitute significant environmental impacts and would be inconsistent with current DFG-MCFCWCD management goals for the pond and it is for these reasons that any alternative including introduction of tidal action was eliminated from consideration in the SEIS/EIR (see discussion of dismissed Alternative Feature 11).

Effects of Diversion on Anadromous Fish Access

During the prior periods of disrepair, access by anadromous and other species from Novato Creek was feasible, however, with the repair, the gates now allow outflow but prevent inflow. This is the baseline condition against which the BMKV expansion potential diversion of some or all of the outflow must be assessed in regards to fish access. Pacheco Pond is not currently tidal, nor is it reasonably foreseeable that MCFCWCD will allow it to be tidal, due to the loss of flood control function of the pond. As a result, the flapgates will continue to be operated as at present, which will continue to hinder anadromous access to the pond and to Arroyo San Jose and Pacheco Creek. It remains feasible for fish to swim against the outflow from Novato Creek at low tide and access the pond,

depending on the extant height of the weir at Bel Marin Keys Boulevard. Obviously, if all flow were diverted from the pond to the BMKV seasonal area, then the hindered access at present would be blocked. However, as noted above, the preferred alternative does not envision permanent closure of the tidal flapgates.

The Draft SEIR/EIS references the hindered access at present, recent assessments of salmonids by NMFS, the paucity of documentation of salmonid runs in Arroyo San Jose and Pacheco Creek, and the likelihood of the recently sighted chinook as being hatchery in origin, as evidence to support the assertion that it is doubtful that there is a self-sustaining run of listed salmonids in these creeks that would be affected by potential diversion of outlet flow and that this impact is considered to be less than significant.

As noted above, the project includes development of a new water management plan for Pacheco Pond by the MCFCWCD, the DFG, and the project sponsors and it is probable that the plan would ultimately call for dual use of the existing outlet to Novato Creek and the new outlet to BMKV. If the existing outlet to Novato Creek is operated, it would be possible to retain the hindered access at present, at least at those times of operation identified in the plan. The Draft SEIR/EIS (page 4-82) recommended that potential fish passage be considered when developing the new water management plan; this has been retained in the Final SEIR/EIS.

8. Levee Heights and Locations

A number of comments questioned the heights and locations of the improvements to the south lagoon levee and the new levees included in the restoration alternatives in relation to the effect on residential views from the BMK community, the amount of area available for potential outflow from the south lagoon, and the amount of area on the expansion site dedicated to upland and transitional habitat as opposed to tidal marsh habitat.

The existing BMK south lagoon levee is mostly at an elevation of 5 feet NGVD. In certain portions the levee has settled as low as 2 feet NGVD. As noted above, in the preferred alternative, the south lagoon levee would be improved to an initial construction height of 6 feet NGVD in order to allow for up to 1-foot of settlement to a design height of 5 feet NGVD. This improvement represents an initial increase of 1 foot in elevation for the most part over the length of the existing levee, but not a long-term change in the design height of the levee. The purpose of improving the south levee is to ensure levee competency so that the levee does not fail, which would result in inundation of the swale with the entire contents of the south lagoon, and to ensure that the swale area on BMKV has sufficient capacity to hold the potential overflow from the south lagoon until the swale can drain the accumulated water on a low tide to Novato Creek. In the Draft SEIR/EIS, the improvement to the south levee included an initial

construction height of 10 feet NGVD and a design height of 6 feet NGVD; the preferred alternative represents a reduction in the initial height by 4 feet and the design height by 1 foot. This change would reduce the visual effects of the improvements.

In the preferred alternative, the new levees have been designed to an initial construction height of 10 feet NGVD (to settle to 8 feet NGVD), representing a 2-foot drop in initial elevation to that in the Draft SEIR/EIS. The location of the new levee separating the tidal marsh area and the non-tidal area has been moved so that it is located at least 1,500 feet from the south lagoon levee. These changes would reduce the visual effects of the new levee sections and would also increase the ponding capacity of the swale to receive overflow from the south lagoon and would increase the amount of upland habitat provided for at the expansion site.

9. Aesthetics

As noted in the prior master response, numerous comments expressed concern about the visual impact of the proposed improved levees and new levees as included described in the Draft SEIR/EIS. The preferred alternative (Revised Alternative 2), now includes a new levee separating the tidal marsh area from the non-tidal habitats that would initially be at a 10 feet NGVD elevation and located approximately 1500 feet from the BMKV south lagoon. This represents a decrease in 2 feet of the initial construction height and a movement of approximately 500 feet from the south lagoon levee. The improved levee along the BMK south lagoon in the preferred alternative would be at an initial elevation of 6 feet NGVD, which represents a 1-foot increase over the present height in most places of the existing levee.

The aesthetics analysis in the Draft SEIR/EIS has been updated to reflect the changes to levee height and location. Due to these changes, the impacts of the preferred alternative are now identified as less than significant. Revised analysis and line-of-sight graphs are presented in the Final SEIR/EIS.

One commenter asserted that previously proposed housing/lagoon development at BMKV would have had “negligible” effects on views from existing BMK south-facing residences adjacent to the south lagoon. However, the EIS/EIR prepared for the project (Environmental Science Associates, Inc 1993) identified (see pages 5.235 through 5.242) that the project would have had a significant impact because it would “obstruct scenic views of San Pablo Bay and surrounding Marin County hills and mountains for residents of the existing Bel Marin Keys community” and no sufficient mitigation was available to reduce the impact to less than significant. Based on the analysis provided in the 1993 EIS/EIR, the impacts of the formerly proposed project appear most acute from the Bahama Reef viewpoint. Further, the formerly proposed project included 1- and 2-story houses that would have been at similar elevation to those in the BMK

community, which would have completely obstructed certain long-range views, particularly from first floors. The proposed wetland project includes new levees that would be lower than the elevation viewpoint of viewers from residences in BMKV (and whose initial construction height has been reduced in the preferred alternative in part to reduce aesthetic impacts).

One commenter also asserted that views of East Bay Hills, Mt. Diablo, or Mt. Tamalpais would be obstructed due to the proposed project. All of these features are well above the horizon as shown in the photographs provided by one individual at the public hearing on August 21, 2002. Since the top of the improved levee segments and the new levees in the preferred alternative would be at initial elevations of 6 feet NGVD and 10 feet NGVD, respectively, they would be well below the most common viewpoint of residents in the BMK community (first floors), which were estimated in the Draft EIR as being around 13 feet NGVD (7 feet NGVD for street level; 1.5 feet for foundation; and 4.5 feet for average viewing height) and views of features above the horizon would not be obscured.

Several comments suggested the use of photographic simulations for the assessment of aesthetics impacts. Because the proposed improvements on the expansion site are homogenous linear levees, the aesthetic character of the levees are simple and easy to describe in narrative form and easy to envision for local residents who are surrounded by existing levees. The key area of concern is the potential obstruction of views. With linear features at known distances from viewpoints, obstruction can be adequately analyzed as a problem of geometry. Thus, the line-of-sight analysis presented in appendix F is considered an adequate methodology to examine potential obstruction of views from the BMK community. Viewpoints from 5 of the street ends facing the south lagoon levee are considered to conservatively represent affected viewpoints. These viewpoints are far closer to the new BMKV levees than most residences on the south lagoon as they represent the nearest points of the community to the expansion site. Overall, this is a conservative methodology appropriate for examining the effect of uniform linear features on potential obstruction of views.

10. Dredged Material Quality and Sources

A number of comments expressed concern over the quality of dredged material that may be used in the project in terms of contaminants such as heavy metals and PCBs. Comments also requested that the dredged material from BMK CSD dredging of the lagoons and Novato Creek be designated a “preferred” source due to its local origin and seed content. The BMK CSD submitted a report concerning the recent analytical data and requested it be included in the Final SEIR/EIS. Finally, comments questioned why dredged material from the Port of Oakland or other locations would be accepted while BMK CSD dredged materials would not be accepted.

Dredged Material Quality

As noted in the alternatives description in chapter 3 of the Draft SEIR/EIS, the BMKV expansion project, like the authorized HWRP, would only accept dredged material that is determined to be suitable for wetland cover by the Dredged Material Management Office (DMMO). As described in the *Hazardous Substances and Waste* section in chapter 4, the DMMO, which is a consortium of regulatory agencies, evaluates dredged material and makes recommendations on its chemical suitability and biological suitability for use in wetlands and uplands based on testing that is specific to the proposed site environment, as well as on criteria and guidance from federal and state laws. Because dredged material would not be accepted from any source if it were not determined suitable for wetland cover, the project has an effective screening mechanism in place to monitor sediment quality.

The standard of use of material deemed suitable for wetland cover would be applied to any source proposing to place dredged material on the expansion site, whether it is the Port of Oakland or the BMK CSD, or others.

BMK CSD Dredged Material

The project sponsors are willing to accept BMK CSD dredged material during the dredged material placement phase, provided that the material is determined to be suitable cover material for use in the wetland project by the DMMO, its reuse is cost-effective to the project, and the timing and other parameters of the material's availability are consistent with the project implementation process. This has been added to the description of the preferred alternative in chapter 3 of the Final SEIR/EIS. The results of the recent analytical data concerning mercury in BMK lagoons and Novato Creek have been added to the Final EIS/EIR in the *Hazardous Substances and Waste* section in chapter 4. These data do not indicate any mercury levels above the allowable criteria for wetland cover found in the current and draft Regional Water Quality Control Board (RWQCB) sediment screening criteria. However, the Draft SEIR/EIS does not make any determinations that dredged material from the BMK CSD or other sources are suitable for use at the expansion site. This is a determination to be made by the DMMO at the time that the dredged material is to be placed on the site. Such a determination cannot be made years in advance of placement since the quality of sediment can change over time. It should also be noted that the DMMO determination is not limited to use of the RWQCB criteria. Thus, while the project sponsors will abide by the DMMO determination of suitability, the project sponsors have made no assessment of the suitability of BMK CSD dredged material at this time.

11. Habitat Design

A number of comments asserted that the proposed project does not promote “diversity” because it does not contain sufficient upland or transition habitat. Comments also asserted that additional upland habitat should be included in the project design to reduce the effects of the project on existing wildlife and to provide buffer areas between the tidal areas and residential areas. The impact of the project on existing wildlife habitat, particularly upland species, is discussed in the next master response. This response discusses the proposed project habitat design in relation to comments on the Draft SEIR/EIS.

Project Goal and Objectives

The HWRP-BMKV expansion project’s goal is “to create a diverse array of wetland and wildlife habitats at the BMKV and HAAF sites that benefit endangered species as well as other migratory and resident species”. Further, one of the project objectives is “to create and maintain wetland habitats that sustain viable wildlife populations, with particular emphasis on supporting Bay Area special status species.” In both of these cited excerpts there is a clear emphasis on the priority of habitat that supports endangered or special status species, while also noting that other wetland or wildlife habitat should be a component of the project. While it is a goal to provide a diverse array of habitats, given the clear emphasis (and importance as described below) of habitat for endangered species, the goal is not interpreted by the project sponsors to require an equal amount of all potential habitats.

Bayland Ecosystem Habitat Goals Report, Prior Habitats Onsite, and Project Design

Contrary to one commenter’s assertion, the proposed project is consistent with the recommendations of the Bayland Ecosystem Habitat Goals Report, which was a collaborative effort involving more than 100 scientists from federal, state, and local agencies as well as private consulting firms and universities. The Goals Report makes specific recommendations for the North Bay and for the HWRP and expansion sites. The recommendations (see page 113 of the Goals Report) include: “restore a wide continuous band of tidal marsh along the bayfront between Black Point and Gallinas Creek and along Gallinas Creek and Novato Creek” and “enhance managed marsh or enhanced seasonal pond habitat on agricultural baylands that are not restored to tidal marsh.” There is a clear priority in the Goals Report for a predominance of tidal habitat for the expansion site, though not necessarily at the exclusion of seasonal marsh, upland or transition habitat.

Tidal wetlands perform a number of critical ecosystem functions for the overall health of San Francisco Bay including: fostering inhabitation by diverse animal and plant life; acting as a buffer between human activity and a healthy estuarine environment, thereby mitigating potential damage to the ecosystem; functioning as a crucial nursery area for fish; and providing a critical nesting ground and migratory transition area for many species of waterfowl.

The entire expansion site, most of the HAAF site, the area now occupied by the BMK residential community, Pacheco Pond, and much of the neighboring industrial park was originally marshland and salt ponds subject to tidal inundation (as identified on page 112 of the Goals Report). These areas have been converted over time due to the building of agricultural levees, military bases, housing, and other developments. As such, there was no original upland habitat on the current expansion site prior to agricultural reclamation except on the adjacent Headquarters Hill, which is outside the restoration area. Several comments also assert that transitional and upland areas have suffered as much or more from development than tidal wetlands and thus should be a substantially larger portion of the habitat mix for the BMKV project. While it is true that substantial amounts of original transitional and upland habitat have been lost in Marin County and the Bay Area in general, the original pre-reclamation habitats lost at the expansion site are all tidal in nature.

Amount of Upland Habitat

One comment asserts that the proposed alternatives have “minimal” upland and transitional habitat. In an effort to be responsive to comments concerned about the upland component, while maintaining consistency with the Goals Report and project objectives, the preferred alternative has been modified to increase upland habitat. The preferred alternative, Revised Alternative 2, now includes 247 acres of upland (excluding areas of seasonal wetland), which constitute approximately 16% of the overall 1,576 acres available on BMKV for potential restoration. Including the 277 acres of proposed seasonal wetland habitat, the non-tidal component of this alternative would be approximately 33 % of the restorable area. Tripling of the areas shown in the Draft SEIR/EIS for Alternative 2, as one commenter recommends would result in about 570 acres of upland, or a total of 930 acres which would be nearly 60% of available restoration area, and would only leave 40% of the site for tidal habitat and seasonal wetlands. This suggested design modification would be inconsistent with the Goals Report recommendations for a “wide continuous band of tidal marsh”, and inconsistent with the project goals and objectives.

As noted in chapter 3, the lead agencies considered alternative habitat mixes with greater non-tidal components, but ultimately selected not to proceed with such alternatives because they provide far less tidal habitat than the selected alternatives and would have far less potential to support viable populations of threatened, endangered and other special status species dependent on tidal marsh.

Further, in the context of estimated historical losses of between 80% and 90% of the tidal wetlands in the San Francisco Bay, the provision of a wide band of tidal marsh at the expansion and HAAF sites would be a significant step in restoring the diversity of the San Francisco Bay ecosystem as a whole.

Regardless of the emphasis on tidal habitat restoration, the conceptual designs have also included transitional and non-tidal habitat components to provide a diversity of wildlife and wetland habitats including transitional marsh, seasonal wetland, and upland in the preferred alternative. These areas allow for transitions and buffers from tidal marsh to adjacent areas as well as habitat for a diversity of species, including the species that currently utilized the nest. While an infinite variety of habitat mixes are theoretically possible, given the priorities established in the Goals Report and other regional planning efforts and the project goal and objectives, the alternatives in the Draft SEIR/EIS are considered to be an adequate range of alternatives as required under CEQA and NEPA.

Finally, the preferred alternative includes a larger upland component than the original Alternative 2 due to the enlargement of the swale area, which would provide a greater amount of available habitat for the upland species.

12. Existing Wildlife Habitat

A number of comments questioned whether the Draft SEIR/EIS adequately assessed the impact of the project on upland wildlife species and on nesting birds that utilize existing trees and structures on the expansion site. Comments also questioned the less-than-significance conclusion of the proposed project's effects on common wildlife species including raptors and other birds, deer and other mammals and recommended retention of the trees onsite, in addition to an increased amount of upland habitat. In particular, comments asserted concern for birds nesting and roosting in the eucalyptus grove near Bel Marin Keys Boulevard.

Wildlife Species

The only species mentioned by commenter that is listed as threatened or endangered is the peregrine falcon. As noted in table D-1 in appendix D, this species is a potential occasional visitor to the expansion site, but no suitable nesting habitat is located onsite. With restoration, there would still be foraging habitat on the site; thus no significant impact to the peregrine falcon is expected.

The following species mentioned by comments are California species of concern: golden eagle (nesting and wintering); white-tailed kite (nesting only); and American white pelican (nesting colonies only). Both golden eagle and white-tailed kite are assessed in table D-1 in the Draft SEIR/EIS. While white pelicans are seasonally present in Pacheco Pond; they are not known to nest locally (in

California, they are known to nest in the Klamath Basin). Table D-1 has been updated to include any additional species of concern mentioned as observed onsite or nearby in the 1993 EIR, which includes Cooper's hawk and sharp-shinned hawk. It should be noted that designation as a species of concern does not afford a species any legal protection, although migratory bird nesting is afforded certain protections under the Migratory Bird Treaty Act and raptor nesting is afforded certain protection under California Fish and Game Code Section 3053.5.

The following species mentioned by comments are not listed, nor species of concern, and are common wildlife species: red-tailed hawk; red-shouldered Hawk; kestrels; great horned owl; barn owl; screech owls; great egret; black-crowned night heron; great blue heron; turkey vulture; passerines (orioles, flycatcher, swallows, and warblers); nighthawks; Canadian geese; coyote; fox; skunk; deer; rabbits; raccoons; possums; ground squirrels; voles; mice; rats; gophers; moles; bats and snakes.

Removal of Existing Trees

Most of the eucalyptus grove near the current informal parking lot is on private land and is thus outside the restoration area and is not proposed for removal. In the preferred alternative, the interpretive center has been moved to the City of Novato property at the HAAF site. The Bay Trail route has been revised to follow around the west side of Headquarters Hill. These changes would allow the retention of most of the eucalyptus trees in and around Headquarters Hill. Some individual trees near Headquarters Hill may need to be removed in order to facilitate levee improvements and trail construction. Other trees on the expansion site along with the former agricultural structures would be removed resulting in the displacement of existing species that could be using them for nesting or roosting. The PG&E power towers would not be removed. With the exception of several isolated oaks, most of the trees on-site are non-native eucalyptus and their removal is not considered significant.

Updates to Draft SEIR/EIS – The impact discussion in the *Biological Resources* section of chapter 4 has been updated to clearly discuss the removal of existing trees and structures and the conversion of agricultural areas to other habitats. Most of the bird species utilizing the site trees and structures are common bird species with extensive alternative habitat located nearby. As noted in the Draft SEIR/EIS, implementation of Mitigation Measures BIO-1, BIO-3, BIO-4, and BIO-5 would reduce the impact on breeding nests of special status bird species that utilize the site. Mitigation Measure BIO-1 has been updated to include several additional species of concern identified in the 1993 EIR as observed on or near the expansion site. An additional impact and mitigation has been added to conduct a pre-construction survey of the existing structures for bats to ensure that structure demolition does not disturb any special-status bats during their breeding season. The section has also been updated to include discussion of the loss of

wildlife habitat related to conversion of the agricultural fields; however due to the regional abundance of nearby diked agricultural fields, this impact is identified as less than significant.

In order to create habitats that are relatively rare in the San Francisco Bay ecosystem, such as coastal salt marsh and seasonal wetlands, it is necessary to convert the existing habitat on the property. While this does result in impacts to existing habitats and the species they support, eventually the value of the site to San Pablo Bay and San Francisco Bay as a whole would be far greater than at present. Overall, the loss of existing agriculture fields and grassland habitat and removal of non-native trees and former agricultural structures and replacement with tidal salt marsh, seasonal wetlands, emergent wetlands, and new upland grasslands is not expected to result in a significant impact to common wildlife.

13. Trails and Use

A number of comments, particularly from the BMK residential community, opposed the establishment of a designated public trail spur crossing the expansion site to Novato Creek due to concerns about noise, private security, and visual disruption. DFG recommended in their comment letter that no spur trail be constructed due to the potential to disrupt sensitive wildlife habitats and species. Some comments recommended that the Bay Trail routing be located on the east side of Pacheco Pond (such as the City of Novato), while others recommended the Bay Trail be routed on the west wide of the pond. Concerns were also raised about routing the Bay Trail close to the BMK residential area and over safety along a future trail along Bel Marin Keys Boulevard. Several comments from the BMK community also expressed concern about project effects on the existing informal use of the south lagoon levee for recreation and questioned whether or not the project sponsors could prohibit continued use by residents of the levee in relation to certain BMK CSD easements. Finally, a number of comments advocated that dogs be allowed to use any recreational trails on the expansion site.

Preferred Alternative Trail Routing

In the preferred alternative, the spur trail Option 2A to Novato Creek has been deleted. The lead agencies decided not to include a spur due to the difficulty in avoiding access impacts on sensitive habitats and sensitive species that exist in Novato Creek and that could become established within the restored wetland areas, in addition to the concerns raised about the proximity of the trail to BMK residential areas.

The preferred alternative also includes a re-routing of the Bay Trail around the east side of Pacheco Pond. The route has also been changed slightly to follow west around Headquarters Hill instead of its existing eastern alignment. This

change was implemented to avoid disruption to the BMK residential area and also to avoid locating a future Bay Trail connection along the blind curves on Bel Marin Keys Boulevard. The lead agencies have determined that the route around the west side of Pacheco Pond, while feasible, would entail a disruption to the existing willow riparian habitat at the confluence of Arroyo San Jose and Pacheco Creeks, would not allow for any buffering between the trail and wildlife habitat, and would involve additional construction disruption and cost due to the need for bridges and boardwalks.

Use of South Lagoon Levee

As noted in several comments, there is informal recreational use of the south lagoon levee by BMK residents as well as other members of the public. The south lagoon levee is located on land owned by the Conservancy and is not a designated public trail. In the preferred alternative, which has no trail spur to Novato Creek, this area would not be designated a public trail. Though implementation of the preferred alternative would eliminate the existing informal use of the south lagoon levee, BMK residents and other members of the public would have access to the new Bay Trail segment to be constructed across the expansion site to connect with existing segments at HAAF and southward. Future plans are to extend the Bay Trail to connect with northward heading segments as well. The replacement of the informal recreational use of levee with a nearby designated and maintained portion of the Bay Trail is not considered a significant effect on land use or recreation. This impact has been clarified in the Final EIS/EIR.

BMK Easements for South Lagoon Levee

A number of comments assert that existing easements held by the BMK CSD relative to the south lagoon levee provides a right of recreational access to the south lagoon levee. The BMK CSD easements for the south lagoon levee are for drainage and maintenance purposes related to the levee itself, which is located on property owned by the Conservancy. Ingress and egress noted in the subject easement(s) are only for the purposes of maintenance or drainage. The easements do not provide an entitlement for BMK community residents or any other persons to access the levee or any other location on the BMKV parcel for recreational purposes. It is for these reasons that the use of the south lagoon levee for walking or walking of dogs is considered an informal use.

Comments provided by the BMK CSD and BMK residents on the Draft SEIR/EIS uniformly opposed any spur trail to Novato Creek, whether along the south lagoon levee or on the new levee to be built for the project. The preferred alternative has no spur trail, in part due to the concerns of BMK residents about public access in proximity to the residential area and in part due to concerns about negative effects of access near restored tidal wetlands and Novato Creek.

However, lack of a designated trail would preclude BMK residents, like any other member of the public, from accessing the south lagoon levee for recreational purposes. The BMK CSD would continue to be able to access the levee for maintenance and drainage purposes, as allowed for by the existing easement. BMK residents, like other members of the public, would be able to access the Bay Trail, which would provide extensive length of recreational trail with scenic vistas for recreational purposes.

Being that the project is on public land, the Conservancy cannot reserve a portion of the project for private access by a certain group of individuals while excluding other members of the public. Thus, in order to allow continued use of the south lagoon levee for recreational purposes by the BMK residents, the Conservancy would need to designate a public trail, which comments from the community specifically opposed. Furthermore, such a designation would also have adverse effects on the existing habitat and restored habitats and incidentally would also not meet the primary purposes of the project.

14. Interpretive Center Location

A number of comments suggested placing the interpretive center on the City of Novato property on the HAAF site to avoid impacts on traffic, wildlife, and disruption to nearby BMK residences. As noted above, in the preferred alternative, the interpretive center would be located on the City of Novato property on the HAAF site. This alternative is supported by the City of Novato (see comment letter L-7).

Since the interpretive center will be placed on lands that are not required for HWRP project purposes, and since the Corps policy greatly limits expenditures for educational facilities, the interpretive center will not be a project feature to be paid for or constructed by the federal government. The land required for the interpretive center is outside the federal project. However, the project design will accommodate the interpretive center construction to be carried out by others. The federal government will be able to share the expenses of some recreation features in addition to the trail, including a parking area, restrooms, and information kiosks (referred to as “access area”). Only land required for these approved features can be cost-shared by the federal government.

15. Mosquito Breeding Habitat and Pest Displacement

A number of comments expressed concern about mosquito breeding habitat and the potential for use of pesticides for mosquito control. A number of comments also expressed concern about the displacement of rodents or other pests during construction into the BMK residential area.

Mosquito Breeding Habitat

As described in the *Public Health* section of the Draft SEIR/EIS, the site already contains mosquito breeding habitat including ponded areas in cultivated fields (not estimated, but fields total about 1,241 acres at present), brackish drainage ditches (36 acres), ponded areas in grassland (not estimated but grassland totals 128 acres), seasonal wetland (114 acres), nontidal salt marsh (21 acres) and open water (15 acres) (see table 4-6). The preferred alternative would eliminate these habitats and replace with other habitat, some of which would be mosquito breeding habitat including open water (21 acres), emergent wetland (12 acres), seasonal wetland (277 acres), and high transitional marsh (79 acres) areas. Due to the use of a majority of the site for tidal marsh in the preferred alternative, which is not mosquito breeding habitat, the proposed project is likely to actually reduce the available areas for potential mosquito breeding. This would reduce the potential use of pesticides or other means of control relative to the existing setting. Regardless, Mitigation Measure PH-1 is included to coordinate with MSMAD in monitoring, water management strategies, and application of EPA-approved pesticides, as needed for mosquito control. Such activities would be similar to those engaged by MSMAD and other parties in adjacent areas that may also provide potential mosquito breeding habitat. The MSMAD in their comment letter, notes their agreement with the analysis and conclusions in the Draft SEIR/EIS concerning the project effects on mosquito habitat.

Pest/Predator Displacement

A certain amount of displacement during construction of pests, including skunks, mice, and rats, would occur due to construction activity. Construction disruption would occur over a 13-year period in the preferred alternative and would only effect portions of the 1,600-acres expansion site at any one time. Thus, existing pests or other wildlife would gradually be displaced from the agricultural and grassland areas as they are changed by site preparation, placement of dredged material, earthworks, and inundation. These species would move to portions of the site that are not currently being disturbed if they provide their habitat requirements or to adjacent offsite areas, such as Pacheco Pond, upland areas at the HAAF site, and the Leveroni parcel that provide upland habitats similar to those present onsite. Some existing species would remain and/or recolonize habitats created on the expansion site. It is possible that some individuals of these species may temporarily move toward adjacent residential areas. This can occur and does occur under existing conditions when wildlife moves from BMKV into adjacent areas. With construction, displacement of pest species may periodically increase, however given that the project area is surrounded by other suitable habitat to which these species could migrate, this effect would be temporary and incidental over a long period of time, this is not considered a significant effect.

16. Construction Disturbance (Air, Noise, Traffic)

A number of comments expressed concern about traffic, noise, and air quality impacts during construction and several suggested that Bel Marin Keys Boulevard should not be used for construction access to avoid these impacts.

As noted above, in the preferred alternative, the primary access route has been moved to approach the expansion site from the Hamilton side in order to reduce construction traffic impacts on Bel Marin Keys Boulevard. Secondary construction access would be via Bel Marin Keys Boulevard.

Construction noise impacts are identified and Mitigation Measure N-1 includes a number of measures designed to reduce the impact of construction noise on adjacent residential areas, including the restriction of hours, as recommended by one comments.

Construction impacts related to air quality and dust are discussed in the Draft SEIR/EIS and Mitigation Measure A-1 includes a range of measures to reduce the generation of PM10 and dust.

During conceptual design, the location of the staging area was moved to the center of the expansion site as shown on the construction figures in chapter 3, where it would be both centrally located and well-separated from adjacent residential areas at the HAAF site and at BMK.

17. Agriculture

A number of comments questioned the conclusion of the Draft SEIR/EIS that the project would not result in a significant effect on agriculture due to the conversion of the existing agricultural use to wildlife habitat uses. In addition, some comments asserted that Marin Countywide Policies concerning agriculture are insufficiently analyzed and that inconsistency with certain policies should be identified as a significant effect of the proposed project. Finally, at least one commenter questioned why the 1993 SEIR/EIS for the previously proposed residential/lagoon development concluded that that project had a significant effect on agriculture, whereas the Draft SEIR/EIS for this project did not.

The Marin County Community Development Agency (MCCDA) is the agency responsible for administering the MCP. According to MCCDA staff in their comment letter on the Draft SEIR/EIS, they do not consider the proposed wetland restoration project a “development” in the context of the MCP (Marin County Community Development Agency 2002). Based on this interpretation, the project would not be subject to the MCP policies for development, including those related to agriculture.

The site is not prime agricultural land and supports a very minor part of current County agricultural production. During the Conservancy appraisal of the BMKV property, the agricultural potential of the expansion site was assessed and agriculture was not considered economically sustainable due to poor drainage, low fertility, and lack of an irrigation supply. Further, the Conservancy has also consulted with an agricultural advisor at the Southern Sonoma-Marín Resource Conservation District (RCD) who also stated that the land was very poor quality for farming due to a number of factors including: soil quality, drainage and lack of water supply (Gustasson, pers. comm., 2001).

The discussion of project effects on agriculture has been expanded in the Final SEIR/EIS to include discussion of economic sustainability and existing CWP policies in greater detail.

The prior SEIR/EIS was conducted in a context of evaluating whether or not a new residential/lagoon, development similar to the existing BMK community, should be allowed to develop in an area of existing agriculture within the diked historic marshlands subzone within Bayfront Conservation Zone. One of the purposes of the subzone is “to foster the enhancement of the wildlife and aquatic value” through allowing uses such as agriculture, wetland restoration, and flood basins (see CWP Policy EQ-2.45). It is not surprising in this context that the prior SEIR/EIS concluded that a significant impact on agriculture would result from the residential/lagoon development. With the restoration project, retention of the site in agriculture use would be far more consistent with the Bayfront Conservation Zone than use for residences and an expanded lagoon. In the event that the prior development would have gone forward, it may have been appropriate to require mitigation to offset the conversion of bayfront lands from the priority uses of habitat and agriculture. In addition, the prior SEIR/EIS used different significance criteria than that used by the lead agencies for the BMKV wetland restoration project. Thus, given the context of the prior housing/lagoon development and divergent methodology, it is also not surprising that the prior SEIR/EIS came to a different conclusion than the current document.

Because the site is not prime, unique farmland or farmland of statewide importance; agriculture is not considered to be economically sustainable onsite due to the low quality of soils, poor drainage and lack of irrigation water; and the site plays a relatively limited role in the County and regional agricultural economy, the loss of agriculture at the expansion site is a less-than-significant impact. As noted in the Draft SEIR/EIS, the project may not be consistent with all CWP policies regarding agriculture, but is overall considered to further the purposes for which the Bayfront Conservation Zone was designated, and these inconsistencies are not considered to be a significant effect. Further, because the project promotes habitat restoration and enhancement within an area in the Bayfront Conservation Zone, the public values for which agriculture onsite was previously considered valuable (namely open space, views, and habitat) are preserved and/or enhanced by the proposed wetland restoration.

18. Climate Change

Climate change was not specifically discussed in the Draft SEIR/EIS. However, rising sea levels were considered during the conceptual design phase of the project. Master Response 2 discussed climate change in relevance to the hydrologic and hydraulic studies conducted for the flooding impact assessment; this response concerns project design.

The design of the new outboard levee (which is the only levee in direct contact with the tide) includes a 0.5 foot allowance in the target design height for mean sea level rise among other factors (see footnote on figure 3-12). In addition, the preferred alternative, Revised Alternative 2, includes periodic increases in levee height as necessary to maintain a barrier to tidal intrusion from San Pablo Bay into the portion of BMKV behind the levee. This “incremental” approach has allowed the initial construction elevation to be lowered from 12 feet NGVD to 10 feet NGVD, as requested by numerous BMK residents who commented on the Draft SEIR/EIS. The previous height of 10 feet NGVD allowed for a far greater margin to account for the potential of accelerating sea level rise. However, projected trends in sea level rise can be taken into account when determining timing of periodic increases in levee height on the site. The upland and non-tidal habitats are all located behind the new proposed levee.

As to the design of tidal wetland areas, while the preferred alternative uses dredged material to reduce the time necessary to reach tidal marsh elevations, it also relies on natural sedimentation for the final cover material. Suspended sediment loading is discussed in the Draft SEIR/EIS in the *Surface-Water Hydrology and Tidal Hydraulics* section in chapter 4 (see page 4-19). Sedimentation rates at locations on the margin of San Pablo Bay near the Petaluma River mouth are estimated to be as much as 0.5 to 1.3 feet per year. Based on current estimates of suspended sediment in areas adjacent to the site and estimates of settlement onsite, it is estimated that the site would take about 10 years to form elevations appropriate for tidal marsh after tidal breach, given the conceptual elevations of dredged material placement (about 2 feet NGVD at the highest). This 10-year period represents an average annual net increase of 1 to 2 inches in marsh elevation. The rate of deposition would be higher in the first years after breach and lower in the later years because deposition rates are dependent on water column depths as well as suspended sediment concentrations (i.e., as depth decreases, if concentrations stay the same, deposition also decreases).

The methodology and data described in *The Probability of Sea Level Rise* (James G. Titus and Vijay Narayanan 1995) were used to make a rough estimate of sea-level rise in San Francisco Bay to compare to the sedimentation rates near the expansion site. The historic estimate of sea-level rise in San Francisco Bay noted in the 1995 EPA document is approximately 0.13 centimeter (cm)/year (or 0.05 inches/year). Using the normalized projections in the EPA document to estimate a global warming-induced increase in sea-level rise, there is a 50% possibility of

an increase of 10 cm (4 inches) between 1990 and 2050 and a 1% chance of a 35 cm (17 inches) in sea-level rise above historic trends. Adding the 2, one can develop a probability-based projection of sea-level rise including the effects of climate change. In this case, the estimates derived are a 50% probability of an 18-cm (7-inch) rise and a 1% probability of a 43-cm (17-inch) rise in sea level between 1990 and 2050. These represent an average annual rise of 0.3 cm (0.12 inches) and 0.7 cm (0.28 inches) for the 50% and 1% probability scenarios.

This rough estimate is not provided as a specific and accurate prediction of potential sea level rise, but is useful to compare to the projected sedimentation rates that are assumed in the project design. As noted above, during the 10 years of initial marsh elevation formation after tidal breaching, the site is expected to accumulate sediment at an average net annual rate of 1 to 2 inches, as compared to the 1% probability scenario for climate-changes of annual average sea-level rise of 0.28 inches. This suggests, that at least in the near term, the net sedimentation rates at the proposed expansion site appear sufficient to result in net increases in marsh elevations to match or exceed projected sea level rise.

The long-term fate of the tidal marsh concerning sea level rise would depend on the future rate of sea level rise compared to the future rate of deposition of suspended sediment and settlement on the site. If sea level rise is more rapid than the net rate of deposition, then tidal marsh could be gradually be converted to tidal flat and then open water. If the net rate of deposition is greater than sea level rise, then the elevation of the marsh should rise with sea level.

Concerning flooding, in the long-term, the rise in sea level is more than likely to result in increased coastal flooding that would effect the BMK community and other communities located along the Bay or along low-lying areas along tidal creeks, such as Novato Creek. Coastal communities around San Francisco Bay will also be faced with flooding challenges if future sea level rise is accompanied by more severe winter storms, induced by climate change. While these are serious concerns, the BMKV wetland restoration project is not a flood control project, and its purpose is not to ameliorate present nor future flooding conditions that are unrelated to the project. The effect of sea rise and potentially more severe winter storms would be higher tide levels and higher peak flows in Novato Creek and its tributaries. However, the relative results of the hydrologic and hydraulic model are considered adequate to extrapolate that even in the event of higher tides and higher flows than those used in the modeling, the mechanisms of flow routing used in the model would still be valid and the proposed project would not worsen flooding relative to conditions without the project.

As coastal communities are likely to be forced to adapt to sea level rise and other effects of climate change, so the project sponsors or their successors may also need to adapt the project or the site. Any such future changes are speculative at this time, but if they involved impacts not discussed in this SEIR/EIS, then a separate environmental compliance process would need to be followed when such changes are identified as necessary.